



AbbeyRoad | 70s Drummer

Manual



The information in this document is subject to change without notice and does not represent a commitment on the part of Native Instruments GmbH. The software described by this document is subject to a License Agreement and may not be copied to other media. No part of this publication may be copied, reproduced or otherwise transmitted or recorded, for any purpose, without prior written permission by Native Instruments GmbH, hereinafter referred to as Native Instruments.

“Native Instruments”, “NI” and associated logos are (registered) trademarks of Native Instruments GmbH.

Mac, Mac OS, GarageBand, Logic, iTunes and iPod are registered trademarks of Apple Inc., registered in the U.S. and other countries.

Windows, Windows Vista and DirectSound are registered trademarks of Microsoft Corporation in the United States and/or other countries.

All other trade marks are the property of their respective owners and use of them does not imply any affiliation with or endorsement by them.

Document authored by: Native Instruments GmbH

Product version: 1.1 (07/2012)

Special thanks to the Beta Test Team, who were invaluable not just in tracking down bugs, but in making this a better product.

Germany

Native Instruments GmbH
Schlesische Str. 29-30
D-10997 Berlin
Germany
www.native-instruments.de

USA

Native Instruments North America, Inc.
6725 Sunset Boulevard
5th Floor
Los Angeles, CA 90028
USA
www.native-instruments.com



© Native Instruments GmbH, 2012. All rights reserved.

Table of Contents

1	Introduction	6
2	About Abbey Road 70s DRUMMER	8
2.1	The Studio	8
2.2	The Team	10
2.3	The Kits	11
2.4	The Recording Equipment: Mixing Desks and Recorders	12
2.5	Microphones	13
2.5.1	Recording the Ludwig	14
2.5.2	Recording the Premier	15
3	Quickstart	17
3.1	Basic Navigation	17
3.2	Editing the Drums	17
3.2.1	Fine-Controlling Individual Drums and Articulations	17
3.2.2	Changing the Snare	18
3.2.3	Creating a Mix	19
3.2.4	Adding and Removing Drums	20
3.2.5	Preset Handling	20
4	The Performance View	22
4.1	Kit Page	22
4.1.1	OH and ROOM MIX Knobs	24
4.1.2	TUNE Knob	25
4.1.3	ATTACK, HOLD and DECAY Knobs	25
4.2	Mixer Page	26
4.2.1	Common Mixer Controls	27
4.2.2	CLOSE MICS Area	28
4.2.3	KIT MICS/BUSES Area	28

4.2.4	Effects	29
4.2.5	Channel Settings	33
4.3	Grooves Page	34
4.4	Options Page	38
4.4.1	VELOCITY Settings	39
4.4.2	MIDI Mapping	39
4.4.3	KIT VIEW Settings	40
4.4.4	RANDOMIZE Settings	40
5	Kit Selection	42
6	Drum Articulations	43
6.1	Open Kit	43
6.2	Tight Kit	46
7	Credits	50

1 Introduction

ABBEY ROAD 70S DRUMMER is an acoustic drum library that gives you premium drum kits, a top of the line world famous studio sound, full mixing control with high quality effects, and a huge selection of MIDI grooves covering a variety of popular music genres. It gives you everything you need to create the perfect drum tracks for all kinds of productions.

Two **70s classic kits** were chosen for the ABBEY ROAD 70S DRUMMER project. Just about every articulation was played on the various drums and cymbals and recorded with up to 25 velocity layers and up to six variations per same-velocity hit. Each kit has up to 18 microphones, which can be mixed separately, including many direct mics, two sets of stereo overheads mics (for the Open Kit), and stereo room mics to capture the ambient sound of the recording space.

The drums were recorded at Abbey Road Studios, the world's first dedicated recording studios. They opened on November 12 1931. The building is an iconic symbol of the international music industry. The studios have been at the heart of the UK music industry for more than 75 years and have been the location of countless landmark recordings and have pioneered new recording techniques and technology. Today, Abbey Road Studios is one of the most technically advanced recording, mixing and post-production complexes in the world.

For many years, Abbey Road benefited from the talents of EMI's research and development division, with custom-built mixing consoles and outboard gear to meet the demands and ambitions of the studio engineers and the artists they worked with. Most of this equipment was only available to EMI studios and was never sold commercially. This equipment, combined with the expertise of our engineers and the unique acoustic properties of the studios, enabled what has come to be known as the "Abbey Road Sound". This sound can be heard on some of the most popular recordings of all time.

Abbey Road and Native Instruments joined forces in 2009 to create outstanding musical instruments based on Abbey Road's legendary equipment, engineering expertise and studio acoustics. Combined with the development and design expertise of Native Instruments, musicians can experience a new level of versatility and musicality.

Document Conventions

This document uses particular formatting to point out special facts and to warn you of potential issues. The icons introducing the following notes let you see what kind of information can be expected:



Whenever this exclamation mark icon appears, you should read the corresponding note carefully and follow the instructions and hints given there if applicable.



This light bulb icon indicates that a note contains useful extra information. This information may often help you to solve a task more efficiently, but does not necessarily apply to the setup or operating system you are using; however, it's always worth a look.

Furthermore, the following formatting is used:

- Text appearing in (drop-down) menus (such as *Open...*, *Save as...* etc.) and paths to locations on your hard drive or other storage devices is printed in *italics*.
 - Text appearing elsewhere on the screen (labels of buttons, controls, text next to checkboxes etc.) is printed in **light blue**. Whenever you see this formatting applied, you will find the same text appearing on the screen.
 - Important names and concepts are printed in **bold**.
 - References to keys on your computer's keyboard you'll find put in square brackets (e.g., "Press [Shift] + [Return]").
- Single instructions are introduced by this play button type arrow.
- Results of actions are introduced by this smaller arrow.

About KONTAKT / KONTAKT PLAYER

ABBEY ROAD 70S DRUMMER is a KONTAKT Instrument; you will, therefore, have to have KONTAKT or the free KONTAKT PLAYER installed on your computer in order to use this instrument. Refer to the KONTAKT / KONTAKT PLAYER documentation to learn how to load and configure KONTAKT Instruments.

2 About Abbey Road 70s DRUMMER

In this chapter, you will find out about Studio Two, the team involved, the drum kits used, and the equipment employed to record ABBEY ROAD 70S DRUMMER.

2.1 The Studio

Studio Two, arguably the most famous studio in the world, has a unique design, acoustic and an unparalleled history of recording. The thick solid wood floor, irregularly laid painted bricks, hanging quilts, bass traps and false dropped ceiling make Studio Two sound like no other. The studio is so good at handling any style of music, from rock and roll sessions through to mid sized orchestras, that the room has remained unchanged since the early sixties.



Studio Two

Artists who have recorded in Studio Two include: Fiona Apple, Kate Bush, The Beatles, Nick Cave and the Bad Seeds, Cliff Richard and The Shadows, David Gilmour, Dido, Green Day, Groove Armada, Idlewild, Muse, Oasis, Underworld, U2, Radiohead, Kanye West, and a wealth of film scores.

Studio Statistics



Open Kit Drum setup

Dimensions	
Height	24ft / 7.31m
Width	38ft 3in / 11.65m
Length	60ft 2in / 18.35m
Floor Area	2131sq ft / 198sq m
Reverberation Time	1.2 sec

2.2 The Team

ABBEY ROAD 70S DRUMMER was recorded by Mirek Stiles and executively produced by Abbey Road's Director of Engineering, Peter Cobbin.

Peter is one of the worlds top recording engineers. He has been responsible for the remixing of The Beatles Yellow Submarine, Anthology and the John Lennon back catalogue. Other artists Peter has recorded/mixed include Air, Keane, U2, Panic at the Disco, Amy Winehouse and Kanye West. Peter also works with many of the film industries celebrated directors and composers and has produced film scores such as Lord of the Rings Trilogy, Shrek the Third, Harry Potter (Order of Phoenix and Half-blood Prince), American Gangster, Hell Boy2 and Terminator Salvation. A keen user of vintage equipment, Peter is responsible for introducing some of Abbey Road's best loved equipment to the audio products community in the form of Abbey Road Plug-ins.

Mirek joined Abbey Road Studios in 1997 and has worked as an engineer on a multitude of pop/ rock sessions as well as many different film scores. Projects include: Fiona Apple, Jon Brion, The Beatles: Yellow Submarine Song Track, The Beatles Anthology 5.1 Remix, The Beatles Love, Nick Cave and the Bad Seeds, Mick Jagger, John Lennon back catalogue remix albums (x5), Muse, Paul McCartney, Dave Stewart, Kanye West and The Lord of the Rings trilogy.



Bret Morgan on Drums

Drumming duties were performed by Brett Morgan, one of London's top session musicians. Brett has worked for the likes of Joni Mitchell, Freddie Mercury, Rod Stewart, George Harrison, Elton John and Sting.

2.3 The Kits

Two vintage kits were chosen for the ABBEY ROAD 70S DRUMMER project:

- The first kit is a **Ludwig Vistalite Tequila Sunrise from the mid 70s**. The size of the drums recorded were 26" kick drum, 14" rack tom and 16" and 18" floor toms. Introduced in 1972, the name Vistalite refers to the transparent plastic that the shells were made out of. Vistalite and acrylic offered a synthetic alternative sound to the standard wood shells. The Ludwig kit was recorded in an open environment in studio two to capture a large roomy drum sound. The Ludwig kit was recorded with an alternative set of overhead mics in addition to the traditional method of stereo overhead placement. This alternative set sees one mic placed directly over the snare drum pointing to the center of the head. The other mic is placed close to the floor tom pointing at the hi-hat. This microphone array is designed to be used in conjunction with the top snare mic and kick out mic to recreate the sound of a recording technique that proved very popular with some recording engineers of the era. This technique was commonly known as the "Glyn Johns" set up.
- The second kit is a **vintage Premier from the 70s**. The size of the drums recorded were 22", 13", 14" and 16". The Premier Drum Company was founded in London 1922. Vintage Premier Kits are highly sort after these days and are recognised as drums of a fine quality. The Premier kit was recorded with the large swing out screens, located at the back of Studio Two, to control the sound of the room. In addition, lots of carpet was laid down to achieve a tight, punchy and dry drum sound that was very popular through out the 70s.

Vintage snare drums used on this project include:

- Ludwig Supra-Phonic 402 chrome 14x6.5.
- Premier 2000 14x5
- Ludwig Black beauty 14x6.5

A selection of vintage 70s Paiste 2002 cymbals and vintage Zildjian cymbals were used on the sessions.

2.4 The Recording Equipment: Mixing Desks and Recorders

Both Kits were recorded via an EMI TG MKIII mixing console and 16 Track analogue 2" tape machine using DolbyA Noise Reduction and Ampex456 tape.

TG consoles, MKI to IV, were in use at Abbey Road from 1968 to 1983. The “MKIII - 24in/16out” was the first TG desk designed for use with 16 track tape machines. The MKI and II had only 8 outputs designed for use with 8 track tape machines.

The EMI TG mixing console was produced by EMI’s Research Laboratories in Hayes, to a design brief submitted by Abbey Road Studios. The design was for a transistor based mixing console to replace the valve REDD mixers which had been in use at Abbey Road since the 50s. The term “TG” is a shortening of “The Gramophone Company”, the name of the company before it merged with Columbia in 1930 to form EMI.



The EMI TG mixing console

Paper work indicates there were probably no more than 30 TG consoles ever made. These consoles of various incarnations and sizes were shipped to EMI studios world wide. About half of these consoles are known to still exist and have become a thing of legend with the unique sound of the microphone pre-amps, compressors and EQ's.

DolbyA is a noise reduction system introduced in 1965 and became very popular throughout the 70's. As track sizes increased from 4 to 8 and then 16, so did the inherent noise associated with analogue tape recording.



The analogue recorder

Dolby A was the first system by Dolby Laboratories intended for use in professional recording studios to tackle this issue. Although the noise reduction is fairly transparent it still adds a certain character to recordings and could be said that it played a large part of the 70s sounds.

Ampex456 tape was introduced in 1975 as a high output mastering tape. Its popularity continued well into the 80s and beyond. All analogue to digital conversion was completed via Prism ADA-8 interfaces.

2.5 Microphones

Abbey Road has arguably the largest vintage microphone collection in the world.



A variety of classic vintage microphones from the extensive collection were used to capture the two drum kits (pictured: AKG D19).

2.5.1 Recording the Ludwig

Microphones used for recording the Ludwig kit:

- **“Glyn Johns” Stereo Overhead:** Beyer M160 – This hypercardioid ribbon microphone has been in production since the mid 60s. This model is unusual in that it’s a ribbon microphone with a hyper cardioid polar pattern (most ribbons were/are figure of eight) and has a double ribbon system. The M160 is still being made today.
- **Stereo Overhead:** Neumann U67 – This valve condenser microphone was conceived as a replacement for the legendary U47 and made its first appearance in the early 60s. The microphone is still in use at Abbey Road today on a daily basis. This was one of the first Neumann microphones to offer a pad switch and hence was very popular for close micing of loud instruments.
- **Kick Out:** AKG D30 – This dynamic microphone from 1958 was and still is (if you can find one!) a very popular kick drum microphone. The microphone uses two transducers to provide selectable polar patterns and was one of the first dynamic microphones to have four different patterns. The D30 has a bigger and fuller sound than the D20 but unfortunately is a lot rarer.
- **Kick In:** AKG D20 – A dynamic cardioid microphone that has been in use at Abbey Road since the early 1960s. This was a very popular bass drum microphone.

- **Hi-hat:** Neumann KM56 – This microphone was introduced to the world in 1956 and is still a popular choice at Abbey Road. A selection of three polar patterns makes it an extremely versatile valve condenser microphone.
- **Snare Top:** SHURE SM57 – Introduced in 1967 the SM57 is still probably one of the worlds biggest selling microphone. The SM57 is a dynamic cardioid microphone.
- **Snare Bottom:** AKG D19 – this dynamic cardioid microphone was first brought into the Abbey Road Studios collection in 1963. The microphones are still in use today. At the time they were very cheap and considered a bit of a work horse, being used on many applications from drums to piano and almost everything between.
- **Toms:** Neumann U67.
- **Stereo Room:** Neumann M50 – The classic Neumann M50 was first introduced to the world in 1952. The valve omni-directional M50 was always considered an orchestral microphone at Abbey Road during the 60s. It is still used at Abbey Road on practically every orchestral session that takes place and is perfect for capturing the ambience of a room, be that a string section or a drum kit.

2.5.2 Recording the Premier

Microphones used for recording the Premier kit:

- **Stereo Overhead:** Neumann U67
- **Kick Out:** Neumann U47 fet (also called FET47) – Production of the tube-based U47 microphone came to an end in 1965, largely due to the fact the VF14 tube used inside the microphone was no longer being manufactured. The FET47 was released to the world in the late Sixties and was intended as a replacement to the U47. Although it is generally accepted it sounds very different to the U47, the FET47 has a character all to its own and is still a highly sought after and well used microphone today. The microphone contains no less than 7 transistors – one of these being FET based. The FET47 is still a firm favorite at Abbey Road for many applications including kick drum.
- **Kick In:** AKG D30
- **Hi-hat:** Neumann KM84 – The KM84 microphone is a small capsule cardioid condenser and was one of the worlds first microphones made with 48v phantom power technology. In the mid sixties microphone design was starting to replace valves with transistors with

results like the KM84 and FET series microphones. The KM is German for “Kleines Mikrofon” (small microphone). Very popular at Abbey Road in the 70s for drums in general, the microphone is still used on a daily basis in the studios.

- **Snare Top:** Neumann U67
- **Snare Bottom:** Neumann KM84
- **Toms:** Neumann KM84
- **Stereo Room:** Neumann M50

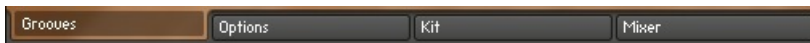
3 Quickstart

In this chapter, you will find a quick guide to navigating the controls of ABBEY ROAD 70S DRUMMER, as well as step by step guides to certain functions.

3.1 Basic Navigation

The interface has four main pages of control. You can navigate among these pages by clicking on the tabs at the bottom of the instrument's Performance View. The different pages and their uses are as follows:

- **Grooves page:** On this page is a browser of many genre-separated MIDI grooves and fills with variations that can be dragged to your host for immediate song creation.
- **Options page:** This page has options for technical kit settings such as kit mapping and velocity options, as well as randomization parameters.
- **Kit page:** You can select each drum on this page to adjust the overhead and room mixes, tuning, and volume envelopes for those drums. You can also select which snare you want to use, as well as load and unload the separate kit pieces.
- **Mixer page:** This page has all of the standard controls for an audio mixer, including levels, panning, solo, mute, send levels and channel routing. This is also where all effect settings and effect routing options are edited.



The four navigation tabs at the bottom of the Performance View

3.2 Editing the Drums

3.2.1 Fine-Controlling Individual Drums and Articulations

To change the individual kit piece's sound settings and articulations:

1. Click on the [Kit](#) tab.

2. To edit the settings for a particular drum or cymbal, just click on its picture. Percussion is selected from a sub-menu of icons next to the drum kit image.
3. To change the overhead and room mix amounts for each piece, adjust the corresponding **OH MIX** and **ROOM MIX** knobs.
4. To alter the tuning, adjust the **TUNE** knob.
5. To change the volume envelope of the selected piece, you can adjust the **ATTACK**, **HOLD** and **DECAY** with the respective knobs.



A typical drum's control panel

3.2.2 Changing the Snare

Each kit has alternate snares to choose from. To change the snare:

1. Click on the **Kit** tab.
2. Click on the snare drum image.
3. Click on the **A** or **B** button located underneath the snare drum image to switch between the snares.

→ The snare image will change to indicate the newly selected snare.



Click the A or B buttons to switch between the snares of a kit.

3.2.3 Creating a Mix

To create a mix of the kit, click on the [Mixer](#) tab. This will give you a virtual mixing console with many of the same controls you would find on a real mixing desk. Here you can control the volume, pan, mute, solo, and routing of the various tracks. You can also add many customizable effects to all channels.



A typical channel on the Mixer page

You can also adjust the levels of the in, out mics on the kick, the top and bottom mic on the snare, and the amount of snare mic bleed when the kick and toms play.



Additional controls for the Kick and Snare channels

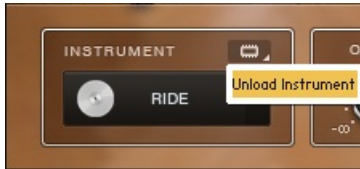
3.2.4 Adding and Removing Drums

If you will not be using a particular drum, cymbal or percussion instrument, you can remove it from the kit, thus freeing up more computer memory. To do this:

1. Click on the [Kit](#) tab.
2. Select the instrument that you want to remove.
3. Click on the small memory chip icon above the instrument name at the bottom left of the page.
4. A drop-down menu will appear, giving you the option to add or remove the instrument from the kit with *Load Instrument* and *Unload Instrument* options. When an instrument is unloaded, a darkened version of it will replace the original image.



If you unload an instrument, you can always load it back again using the same method.




Unloading an instrument on the Kit page.

3.2.5 Preset Handling

- ▶ To step through the presets, simply click on the right and left arrows.
- ▶ To load a preset, simply select the preset from the drop-down menu.

Saving User Presets

You can save presets for the settings of the whole mixer on the Mixer page, as well as kit mapping layouts on the Options page. Each of these preset menus contains a selection of factory presets and allows you to save your own custom presets. Factory presets cannot be overwritten (indicated by the darkened  icon), but they can be adjusted and saved as a new user preset.


To save a user preset:

1. Adjust the settings you want to save and recall for your preset.
 2. Click in the text area on the preset drop-down menu.
 3. Type in the name for the new preset and click on the Save icon above the drop-down menu.
- The new preset will now appear at the bottom of the drop-down menu and is ready to be used when opening the kit again.



If you save a user preset without changing the name, it will overwrite the current user preset.

Removing User Presets

1. To remove a user preset:
 2. Select the preset in the drop-down menu.
 3. Click on the  icon above the drop-down menu.
- The user preset will be deleted and not be available when opening the kit again.

4 The Performance View

This chapter describes the Performance View interface of ABBEY ROAD 70S DRUMMER. Learn how to use the functions and controls of the four pages: [Kit](#), [Mixer](#), [Grooves](#) and [Options](#).

4.1 Kit Page

The [Kit](#) page has a view of the drum kit where you can select each drum and adjust:

- the tuning
- the volume envelope
- the overhead microphone mix
- the room microphone mix

You can also choose which snare you want to use, as well as load or unload the selected drum.



Kit page Performance View of the Open Kit

To select a drum or cymbal for editing, click on it with the mouse. To select a percussion instrument, click on its icon at the right of the drum kit image. For details on editing the instrument settings on the [Kit](#) page, see section [↑3.2, Editing the Drums](#).



Clicking on an instrument will also play the sound of that instrument, giving you a quick preview of the sound. For instructions on how to disable (or enable) sound playback on mouse click, see section [↑4.4.3, KIT VIEW Settings](#).

After selecting an instrument, its name and controls will appear in the panel at the bottom of the page. Editing the sound of a selected instrument will edit all articulations of that instrument.

Each kit has two snare drums to choose from. You can select the snare drum you want to use by clicking on the **A** and **B** buttons below the snare image. Switching between the snares will unload the current snare from memory and load the other one, and will change the image of the snare drum.

When the **SELECT BY MIDI** icon at the upper right of the Kit page is activated, the drums will be selected depending on the notes played with your MIDI input device.



This function is automatically turned off during host playback, or while the file player of the KONTAKT stand-alone application is running (e.g. playing back a MIDI groove).



You can also select the kit pieces by using the **INSTRUMENT** drop-down menu at the left of the panel at the bottom.

You can remove the selected instrument from the kit (and thus unload it from memory) by clicking on the small memory chip icon to the right of the **INSTRUMENT** header, as described in section [↑3.2.4, Adding and Removing Drums](#). Removing unused kit pieces is useful for freeing up computer memory. You can always load the kit pieces back at any time. When a kit piece is unloaded, its image turns dark.

The rest of the panel contains the controls for the Overhead (OH) and Room microphone mixes, the drum Tuning control, and the volume envelope of the drum with controls for the Attack, Hold, and Decay (AHD envelope). For more information on these controls, see sections [↑4.1.1, OH and ROOM MIX Knobs](#), [↑4.1.2, TUNE Knob](#), and [↑4.1.3, ATTACK, HOLD and DECAY Knobs](#).

4.1.1 OH and ROOM MIX Knobs



OH MIX and ROOM MIX knobs

The **OH MIX** and **ROOM MIX** knobs adjust the volume levels of the Overhead microphone(s) and the Room microphone(s) of the selected drum, cymbal, or percussion instrument. This allows you to create your own custom mix of those microphones for each individual drum, which is not possible in a traditional studio recording.



Please note that this is a separate control from the overall level of the OH and Room mics. These levels can be adjusted on the [Mixer](#) page.

4.1.2 TUNE Knob



TUNE knob

The **TUNE** knob changes the pitch of the selected kit piece. The pitch changes for all microphones and all articulations of that piece. The range of the **TUNE** knob is limited to values that are relatively realistic.

4.1.3 ATTACK, HOLD and DECAY Knobs



ATTACK, HOLD and DECAY knobs

The **ATTACK**, **HOLD** and **DECAY** knobs are controls for a typical AHD volume envelope for each selected drum.

- Increasing the **ATTACK** value adds more of a fade-in to the beginning of the sound.
- The **HOLD** knob adjusts how long the sound stays at maximum volume.
- The **DECAY** knob adjusts how quickly the sound fades out after the **HOLD** time has passed.

For the most natural drum sound, the default setting is the best (**ATTACK** is off, and **HOLD** is at maximum). Adjusting these controls is only necessary if you want to shape the sound in an “unnatural” way.

4.2 Mixer Page

The **Mixer** page has the same microphone level and panning controls as a real mixing board, as well as a large selection of effects and routing controls. You can save and load all mixer settings by using the **MIXER** panel at the upper left of the page. This panel appears on every page of ABBEY ROAD 70S DRUMMER, in order to select different mixer page presets while using other parts of the interface. As each kit has a very different sound, these mixer presets can only be used for the kit that they are saved with.



Mixer page Performance View

4.2.1 Common Mixer Controls

- The channel faders on the [Mixer](#) page control the **volume level of the various microphones**. The faders in the [CLOSE MICS](#) area control the volume of the individual direct microphones, and the [KIT MICS](#) faders control the volume of the overhead and room microphones.



The levels of each instrument within the overhead and room microphones can be adjusted separately, but this is done on the Kit page (see section [↑4.1, Kit Page](#) above).

- Each close mic and mono kit mic has a **PAN** knob to change the left and right location of that mic in the stereo field.
- Each stereo kit mic has a **WIDTH** knob, ranging from **MONO** to **STEREO**. **STEREO** is the standard setting, where the left and right channels are independent on the left and right sides. As the knob is turned towards **MONO**, the left and right channels are combined until they become a single central sound source when the knob is turned all the way to the left.
- The **S** and **M** buttons allow you to solo (**S**) and mute (**M**) the individual channels. When a track has the Solo button pressed, all other channels are silent and only the soloed channel can be heard. Putting additional channels into solo mode will add those channels into the mix, but still keep all other channels silent. When the mute button is pressed, the selected track can no longer be heard. Mute has a higher “ranking” than solo, so if a track has both buttons pressed, the track will be muted.
- The **SEND** knob at the top of each channel controls the amount of reverb effect to be included in the mix for that channel. The global reverb level is adjusted with the reverb fader in the **BUSES** area.

4.2.2 CLOSE MICS Area

The **CLOSE MICS** area takes up the left portion of the **Mixer** page. As the name suggests, this area contains the **channel controls for the close microphones**. The close microphones (also known as “direct” mics) are placed very close to the drums. There are close microphones for the kick, snare, hi-hat, toms, and some percussion.

4.2.3 KIT MICS/BUSES Area

The right portion of the **Mixer** page displays the controls for either the kit microphones or the busses:

The **Kit Microphones view** includes controls for the overhead and room microphones. These microphones are placed in such a way to record the sound of the entire kit, either with a stereo pair or with a single mono microphone.

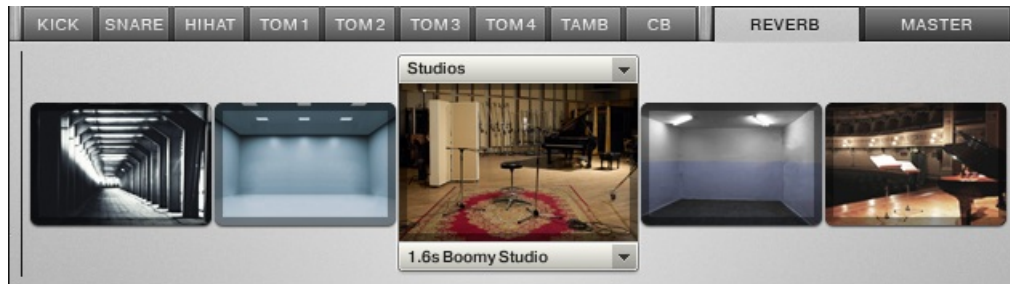
The controls in the **Buses view** are used to adjust the levels of the master output, master panning and reverb return level.

- ▶ To switch between the Kit Microphones and Buses view, click on the **BUSES** or **KIT MICS** button, respectively, both of which are located at the top-right of the **Mixer** page.
- ▶ You can also switch the left and right position of the master out with the **L↔R** button on the **MASTER** channel. All channels are labeled at the bottom, and the labels are highlighted when editing the channels.

4.2.4 Effects

Several new high quality effects are included with ABBEY ROAD 70S DRUMMER, specifically tailored for acoustic drum production. These effects are **Convolution Reverb**, **Solid G-EQ**, **Solid Bus Comp**, **Tape Saturation**, and the **Transient Master**. Each of these effects can be turned on or off for any of the channels by clicking on the LED next to each effect name at the bottom of the page.

Convolution Reverb



Convolution Reverb effect

The Convolution Reverb includes many impulse samples of some of the best acoustic spaces for acoustic drum production.

- ▶ To **select an acoustic space**, click on the **BUSES** tab and then click on the **Reverb** channel. The various spaces will then appear at the bottom of the screen.
- ▶ To **shift the selection over to reveal more room types**, click on the room images to the right and left of the selected image.

- ▶ To **select the room type**, click on the drop-down menu above the selected room image. The drop-down menu below the room image allows you to select a specific room preset within that room type.
- ▶ To **adjust the overall level of the reverb**, move the fader on the Reverb channel. The amount of reverb in each channel is adjusted with the **SEND** knobs at the top of each microphone channel.

Solid G-EQ



Solid G-EQ effect

The SOLID G-EQ is a uniquely musical EQ. Up to four frequency ranges can be adjusted with high precision.

- The **HZ/KHZ** knobs set the center frequency that is being adjusted with the EQ.
- For the two mid frequency ranges, there are **Q** knobs to adjust the width of the bell curve for the adjusted frequency range.
- The **DB** knobs adjust the gain boost or gain reduction of the selected frequencies.
- The low and the high frequencies can switch between bell curve and shelf modes by clicking on the **BELL** button.
- The **OUTPUT** knob on the right side adjusts the overall output level.

Solid Bus Comp



Solid B-Compression effect

Also available as a fully-fledged product in its own right, this virtual reproduction of a legendary compressor adds presence and drive to your drums without blurring the detail.

- The **ATTACK** knob adjusts the amount of time in milliseconds that it takes for the compressor to reach the ratio after the input signal exceeds the threshold level.
- The **RELEASE** knob adjusts the amount of time in milliseconds that the compressor will take to stop affecting the sound after the input signal falls below the threshold.
- The **THRESHOLD** knob adjusts the level in dB that the input signal must exceed before the compressor starts affecting the sound.
- The **RATIO** knob controls the amount of compression expressed as a ratio of “input level” to “output level change”. The higher the **RATIO** knob is set, the more the output level will be reduced as the sound goes beyond the threshold.
- The **MIX** knob allows you to add the dry signal to the mix as well, for a parallel compression sound.
- The **MAKEUP** knob allows you to increase the overall output level of the compressed sound.
- The **OUTPUT** knob on the right side adjusts the overall output level.

Tape Saturator



Tape Saturator effect

The Tape Saturator adds the simulated warmth of sound that comes from an analog tape machine.

- The **WARMTH** knob manipulates the frequencies of the audio to give a “warming” tone to the sound.
- The **GAIN** knob adjusts the amount that the input signal is boosted with the saturated sound.
- The **HF** knob takes away the highest frequencies in a similar way that analog tape rolls off those high frequencies.
- The **OUTPUT** knob on the right side adjusts the overall output level.

Transient Master



Transient Master effect

The Transient Master can subtly or drastically change the sound of the drums, depending on how you want to use it.

- The **INPUT** knob adjusts the level of the input signal going into the effect.

- The **ATTACK** knob adjusts the level of the attack of the signal.
- The **SUSTAIN** knob adjusts how long the sound will ring out, which can effectively sound like changing the dampening or the size of the various drums, or even changing the size of the room that the drums are in.
- The **OUTPUT** knob on the right side adjusts the overall output level.

4.2.5 Channel Settings

Each channel has its own settings for effect routing and channel output routing, and each mic channel can also be unloaded from memory if not in use.



Channel Settings view for the Kick Drum

- In the **FX ROUTING** area, there are four different effect routing presets to choose from. These change the order of which effect comes before the other, depending on your preference in a mix (for example, some engineers prefer to use EQ before compression, while others prefer to use it after compression). The signal chain of the effects goes from left to right according to the image, and you can step through the different order presets using the right and left arrows.
- The **CHANNEL** area gives an **OUTPUT** drop-down menu to select which output that channel will be routed to. Please note that the channel outputs must first be setup in KONTAKT before being able to route them here. To unload a channel that is currently not in use from your computer's memory, select it from the drop-down menu (represented by a memory chip icon) in the top-right corner of the **CHANNEL** area. You can always load that channel back at any time.

Additional Kick and Snare Controls

The [Kick](#) and [Snare](#) close microphones have additional controls to adjust multiple direct microphone levels:

- For the [Kick](#) close mic, there is an additional area on the left where you can adjust the separate levels of the Direct In mic (placed inside the kick drum pointing towards the front head) and the Direct Out mic (placed a short distance outside of the kick drum).
- For the [Snare](#) close mic, there is an additional area on the left where you can adjust the separate levels of the Direct Top mic (placed over the snare drum pointing down), the Direct Bottom mic (placed under the snare drum pointing up), and the Snare Bleed. The Snare Bleed fader adjusts the amount of the “buzzing” sound that the bottom of a snare produces when resonated by the Kick and Toms.

4.3 Grooves Page

The [Grooves](#) page is a browser with a huge library of organized MIDI grooves that can be used to quickly create drum parts for a song or production. You can edit several parameters to change the beats, and all grooves can be dragged into your host.

The [GROOVE](#) panel at the top right of the page allows you to play the groove with the play button, and select through the variations of that groove with the right and left arrow buttons. This panel is available on every page of ABBEY ROAD 70S DRUMMER so you can play the grooves when using any of the other pages.

- To use a groove in your host, click in the area of the groove name and drag the groove to your track in the host. A MIDI file of the groove will be created in your track.



Grooves page Performance View

The **GROOVE BROWSER** has a total of three columns:

- The leftmost column shows a list of Genre folders, each with its own set of customized Grooves, Fills and Variations.
- The middle column shows the list of Grooves and Fills available for that Genre. The standard time signature is 4/4, unless otherwise shown in the name of the Groove or Fill. And the end of each Groove, there is a suggested BPM (beats per minute) tempo to use, but the grooves can be used at any tempo.

- The rightmost column is a list of all Variations for the selected Groove or Fill. To select a Variation, double click on the variation name. After selecting one variation, you can use the up and down arrows on your computer keyboard to select among the variations, or the right and left arrows in the **GROOVE** panel.

Available Grooves

The five genres included with ABBEY ROAD 70s DRUMMER are Funk, Hard Rock, Disco, Progressive Rock, and Reggae/Ska.

A Groove for a particular Genre is a typical beat that would be used for that genre. Similarly, a Fill for a particular Genre is a drum fill that would be used in music for that genre. A Variation has the same general sound and feel of the main Groove or Fill, but has some small changes, ranging from different hi-hat rates to additions of ghost notes to changes of drums used, etc. The different Variations have key words in their names to identify the changes made in a particular variation, which are listed below:

- *4th, 8th, 16th*, etc.: This represents the note division on which the tempo of the groove is played or felt. This is usually based on the instrument that is keeping the time, such as the hi-hat or ride cymbal.
- *Hat/Ride/Other*: This is the instrument that is keeping the time of the groove, typically a hi-hat or ride cymbal.
- *Closed/Open/Both*: This term is used when a hi-hat is keeping the time, and describes whether the hi-hat is always closed, always open, or uses both closed and open hits. This term will not be used if a ride cymbal or other instrument is keeping the time.
- “Extra”: Sometimes an extra word is added at the end to classify the sound of the groove:
 - *Ghost*: This is used when there are additional ghost notes added to the groove, such as snare or kick ghost hits.
 - *Side*: This term is used if a snare sidestick is used instead of a center hit.
 - *Toms*: When additional toms are included in the groove, this term will appear.
 - *Perc*: If additional percussion sounds are used, which includes extra percussion such as cowbells or hand claps, as well as “rim only” articulations, then this term will be used.

- *Multi*: If more than one of the above sounds or techniques is used, then the term at the end will be Multi to represent multiple types.

Groove Controls

- The **TIGHTNESS** knob changes the amount of “groove” in the beat. The center value is the original sounding played beat. When turned all the way to the right, the beat is completely quantized and “machine-like”. As the knob is turned to the left, the beat gets more and more loose until it sounds very “sloppy” when turned all the way to the left. Depending on the type of music, all knob positions can be useful for different styles.
- The **SWING** knob adjusts the amount of swing in the beat. Swing allows for rhythmic shifting of a groove where the first note in a series plays longer than the one that follows. When the knob is all the way to the right, the swing is the most severe. When all the way to the left, a “negative” swing is applied, where the first note in the series is actually shorter than the one that follows. Different time signatures affect the swing in different ways, so it is often best just to try the **SWING** knob to see how it sounds with the selected groove.
- The **GRID** selector allows you to select different quantization timings for the **TIGHTNESS** and **SWING** knobs. For example, selecting $1/8$ will push the grooves towards or away from the 8th notes of the beat when using the **TIGHTNESS** knob.
- The **VELOCITY** knob changes the range of the velocities in the grooves. At the center position, the groove plays with the same velocities that were recorded with it. As the knob is turned to the right, the range is “compressed” to the high range so that all velocity values increase until they are all at maximum when the knob is all the way to the right. Similarly, when the knob is turned to the left the velocities are “compressed” to the low range until all velocities are the lowest when turning the knob all the way to the left.
- The **TEMPO** selection buttons allow you to immediately change the tempo of the groove or fill to be half the speed or double the speed of the originals. This can be useful when a song is recorded at a high BPM tempo, but the feel of the song is actually half of that speed (or vice versa).

4.4 Options Page

The [Options](#) page is where additional “technical” parameters of a kit are adjusted, such as the MIDI note mapping and velocity ranges. There is also a [RANDOMIZE](#) section where various sound parameters have random values applied.



Options page Performance View

4.4.1 VELOCITY Settings

The **VELOCITY** area at the top allows you to fine-tune the way ABBEY ROAD 70S DRUMMER responds to MIDI input:

- In the **CURVE** section you can select a curve for incoming MIDI note velocities. The default is a linear curve, but many MIDI input devices have different levels of sensitivity, making a convex or concave curve more appropriate. There is also an option to select a constant “fixed” velocity (represented by a horizontal line).
- Utilizing the **RANGE** controls, you can change the lowest and highest velocity values. This is useful for preventing the quietest and/or the loudest sounds from playing, and instead be limited to the specified minimum and maximum. Different MIDI input devices, such as MIDI keyboards and electronic drum kits, will also need their own velocity setting adjustments to match your playing style.

4.4.2 MIDI Mapping

The **MIDI MAPPING** area contains all of the controls for changing the mapping layout of the kits. Each articulation can be assigned to one or more MIDI notes, allowing for your own customized mapping. This is very useful for adjusting the mapping to the way that suits you best when playing the drums with a MIDI keyboard, or for adjusting the mapping to a custom electronic drum setup.

To assign the MIDI notes manually by entering or selecting the note in the **NOTE** selector:

1. Select the **INSTRUMENT** and the **ARTICULATION** in the drop-down menus.
2. Click on the checkbox next to the **APPLY CHANGES?** label.

→ The changes will be applied.



You can also click the **SELECT BY MIDI** icon to change to the **NOTE** value by playing the MIDI note, and then following the procedure above to assign the note.

All custom MIDI mappings can be saved and loaded from the mapping preset menu.

Mapping Presets

ABBEY ROAD 70S DRUMMER also comes with a selection of mapping presets that are set up to work with popular software and electronic drum setups. These include General MIDI, V-Drums (two options), DrumIt Five, EZDrummer, Superior Drummer, BFD, iMap, and Addictive Drums.

There is also a special LEGACY mapping that follows the mapping of the ABBEY ROAD 70S DRUMMER. Previous owners who update to the ABBEY ROAD 70S DRUMMER can use that mapping to open up older projects in their DAW. These mappings can be selected from the **PRESET** drop-down menu in the **MIDI MAPPING** area. If you want to make changes to these mappings, you can always do so and save the mapping preset under a different name.



Please keep in mind that every e-drum setup is different, and almost every drum kit has some particularities to it. Therefore the mapping presets will not fully match your e-drum setup without any adjustments. These mapping presets have been included to provide you with the best possible starting point. You can make additional changes to these mappings and save a new preset to fit your e-drum needs.

4.4.3 KIT VIEW Settings

The **KIT VIEW** area holds the properties of the **Kit** page:

- **TRIGGER ON MOUSE CLICK**: This option defines if the sound of an instrument is played back when the instrument's image on the **Kit** page is clicked on with the mouse.
- **SHOW TRIGGER STATES**: This option defines whether the drum kit view on the **Kit** page displays a real-time animation when instruments are triggered (played) during song or MIDI groove playback.



It is recommended to deactivate the **SHOW TRIGGER STATES** option when computing power is scarce, e.g. when working on projects with high track counts. Switching off the user interface animations may considerably reduce the CPU load.

4.4.4 RANDOMIZE Settings

The controls in the **RANDOMIZE** area add custom levels of humanization and variation in the sound output. The higher the value of a knob, the higher the range of randomization for the relevant control. The randomized parameters are:

- **VOLUME:** The volume level of the played drum increases or decreases by a random amount with each hit.
- **VELOCITY:** The velocity of the played drum will increase or decrease slightly, which can trigger different samples above or below the one at the original velocity.
- **TIME:** This will add a slight random amount of delay to each hit.
- **PITCH:** The pitch of the played drum will be higher or lower by a slight amount with each hit.
- **TONE:** This will slightly change the frequency curve of each hit. Different drums have different frequency ranges, specific to the sound of each drum.



A good way to add even more subtle variation to the sounds in the kit is to change the randomization parameters just slightly, especially the **PITCH**, **TONE** and **VOLUME** knobs. For all knobs, turning them a maximum of a quarter of the way up will allow the effect to remain subtle. Turning these knobs up to a high value can be used for a more experimental sound.

5 Kit Selection

There are a total of four main instrument NKIs included with ABBEY ROAD 70S DRUMMER:

- **AR 70s Open Kit Full:** This is the full version of the Open Kit with all samples and microphones included.
- **AR 70s Tight Kit Full:** This is the full version of the Tight Kit with all samples and microphones included.
- **AR 70s Open Kit Lite:** This is a version of the Open Kit that includes all velocity layers, but has no sound variations for same velocity hits. This kit has a smaller memory footprint as well as a faster loading time than the full kit.
- **AR 70s Tight Kit Lite:** This is a version of the Tight Kit that includes all velocity layers, but has no sound variations for same velocity hits. This kit has a smaller memory footprint as well as a faster loading time than the full kit.

6 Drum Articulations

Here is a comprehensive list of all drums and articulations included with each kit.

6.1 Open Kit

Drum	Articulation	Default Key / MIDI Number
Kick	Dampened	C1 / 36
	Half Open	A#4 / 82
	Open	C3 / 60
Snare 1 & 2	Center Left Hand	A4 / 81
	Center Right Hand	B4 / 83
	Center Right/Left Alternating*	D1 / 38
	Halfway Left Hand	C5 / 84
	Halfway Right Hand	D5 / 86
	Halfway Right/Left Alternating *	E1 / 40
	Rimshot	D#1 / 39
	Sidestick	C#1 / 37
	Flam	D3 / 62
	Roll	D#3 / 63
	Wires Off	E3 / 64
	Rim Only	C#3 / 61

Drum	Articulation	Default Key / MIDI Number
Hihat	Closed Tight Tip Right Hand	D#5 / 87
	Closed Tight Tip Left Hand	C#5 / 85
	Closed Tight Tip Right/Left Alternating *	F#3 / 66
	Closed Tip Right Hand	G#5 / 92
	Closed Tip Left Hand	F#5 / 90
	Closed Tip Right/Left Alternating*	F#1 / 42
	Closed Shank Right Hand	C#6 / 97
	Closed Shank Left Hand	A#5 / 94
	Closed Shank Right/Left Alternating *	G#3 / 68
	Closed Pedal	G#1 / 44
	Open Pedal	A#3 / 70
	Open Quarter	E4 / 76
	Open Half	F4 / 77
	Open Three-Quarters	F#4 / 78
	Open Loose	G4 / 79
	Open Full	G#4 / 80
	Open Controller**	A#1 / 46
Tom 1 (Rack Tom)	Center Right Hand	E6 / 100
	Center Left Hand	D6 / 98
	Center Right/Left Alternating *	B1 / 47
	Rimshot	B3 / 71
	Rim Only	D#4 / 75
Tom 2 (Floor Tom Hi)	Center Right Hand	C6 / 96
	Center Left Hand	B5 / 95
	Center Right/Left Alternating *	A1 / 45
	Rimshot	A3 / 69
	Rim Only	D4 / 74

Drum	Articulation	Default Key / MIDI Number
Tom 3 (Floor Tom Low)	Center Right Hand	F5 / 89 (A5 / 93)
	Center Left Hand	E5 / 88 (G5 / 91)
	Center Right/Left Alternating *	F1 / 41 (G1 / 43)
	Rimshot	F3 / 65 (G3 / 67)
	Rim Only	C4 / 72 (C#4 / 73)
Cymbal 1 (Crash 1)	Edge	C#2 / 49
	Tip	C2 / 48
	Bell	D2 / 50
	Choke ***	A#-1 / 22
Cymbal 2 (Crash 2)	Edge	G2 / 55
	Tip	F#2 / 54
	Bell	G#2 / 56
	Choke ***	B-1 / 23
Cymbal 3 (Ride)	Tip	D#2 / 51
	Bell	F2 / 53
	Edge	E2 / 52
	Choke ***	C0 / 24
Cymbal 4 (Sizzle Ride)	Tip	A#2 / 58
	Bell	B2 / 59
	Edge	A2 / 57
	Choke ***	C#0 / 25
Tambourine	Tap	G0 / 31
	Shake	G#0 / 32
Clap	Solo	A0 / 33
	Multi	A#0 / 34
Stick Hit	Solo	B0 / 35

Drum	Articulation	Default Key / MIDI Number
High Cowbell	Open	E#0 / 29
	Muted	F#0 / 30
Low Cowbell	Open	D#0 / 27
	Muted	E0 / 28
Shaker	Shake	D0 / 26

6.2 Tight Kit

Drum	Articulation	Default Key / MIDI Number
Kick Drum	Dampened	C1 / 36
	Open	C3 / 60
Snare Drum 1 & 2	Center Left Hand	A4 / 81
	Center Right Hand	B4 / 83
	Center Right/Left Alternating *	D1 / 38
	Halfway Left Hand	C5 / 84
	Halfway Right Hand	D5 / 86
	Halfway Right/Left Alternating *	E1 / 40
	Rimshot	D#1 / 39
	Sidestick	C#1 / 37
	Flam	D3 / 62
	Roll	D#3 / 63
	Wires Off	E3 / 64
	Rim Only	C#3 / 61
	Towel	F6 / 101

Drum	Articulation	Default Key / MIDI Number
Hihat	Closed Tight Tip Right Hand	D#5 / 87
	Closed Tight Tip Left Hand	C#5 / 85
	Closed Tight Tip Right/Left Alternating *	F#3 / 66
	Closed Tip Right Hand	G#5 / 92
	Closed Tip Left Hand	F#5 / 90
	Closed Tip Right/Left Alternating *	F#1 / 42
	Closed Shank Right Hand	C#6 / 97
	Closed Shank Left Hand	A#5 / 94
	Closed Shank Right/Left Alternating *	G#3 / 68
	Closed Pedal	G#1 / 44
	Open Pedal	A#3 / 70
	Open Quarter	E4 / 76
	Open Half	F4 / 77
	Open Three-Quarters	F#4 / 78
	Open Loose	G4 / 79
	Open Full	G#4 / 80
	Open Controller **	A#1 / 46
Tom 1 (Rack Tom Hi)	Center Right Hand	E6 / 100
	Center Left Hand	D6 / 98
	Center Right/Left Alternating *	B1 / 47
	Rimshot	B3 / 71
	Rim Only	D#4 / 75
	Towel	B6 / 107

Drum	Articulation	Default Key / MIDI Number
Tom 2 (Rack Tom Low)	Center Right Hand	C6 / 96
	Center Left Hand	B5 / 95
	Center Right/Left Alternating *	A1 / 45
	Rimshot	A3 / 69
	Rim Only	D4 / 74
	Towel	A6 / 105
Tom 3 (Floor Tom)	Center Right Hand	F5 / 89 (A5 / 93)
	Center Left Hand	E5 / 88 (G5 / 91)
	Center Right/Left Alternating *	F1 / 41 (G1 / 43)
	Rimshot	F3 / 65 (G3 / 67)
	Rim Only	C4 / 72 (C#4 / 73)
	Towel	G6 / 103
Cymbal 1 (Crash 1)	Edge	C#2 / 49
	Tip	C2 / 48
	Bell	D2 / 50
	Choke ***	A#-1 / 22
Cymbal 2 (Crash 2)	Edge	G2 / 55
	Tip	F#2 / 54
	Bell	G#2 / 56
	Choke ***	C0 / 24
Cymbal 3 (Ride)	Tip	D#2 / 51
	Bell	F2 / 53
	Edge	E2 / 52
	Choke ***	B-1 / 23
Cymbal 4 (Pang)	Tip	A#2 / 58
	Edge	A2 / 57 (B2 / 59)
	Choke ***	C#0 / 25

Drum	Articulation	Default Key / MIDI Number
Clap	Solo	A0 / 33
	Multi	A#0 / 34
Tambourine	Tap	G0 / 31
	Shake	G#0 / 32
Stick Hit	Hit	B0 / 35
Roto Tom	High	F#0 / 30
	Mid	E#0 / 29
	Low	E0 / 28

* There is a separate note assignment that alternates between the left and right hand samples of the center and halfway snare, center tom, and closed hi-hat articulations when playing faster than a certain speed. This adds a realistic sound to faster playing, as a drummer would also switch to using both hands at fast speeds.

** There is a separate note assignment for the open hihat that controls the amount of hihat openness depending on the position of the Modwheel controller (CC1) or a hi-hat foot controller (CC4). At the 0 position of the controller, the open hihat control key plays the fully open hihat. As the controller sends higher values, playing the open hihat control key will trigger hihat samples that gradually become more closed.

*** Cymbal choke samples are triggered by specific note assignments which play release samples. When playing a cymbal sound, triggering the choke sample will play the sound of a choked cymbal which relates to the current volume of the played cymbal. If no cymbal sound is currently active, then the cymbal choke notes will do nothing. Choke samples can also be triggered with electronic drum pads which support the choking feature, as well as with keyboard aftertouch.

7 Credits

Product Design: Dinos Vallianatos, Paul Maurer, Frank Elting

Sound Design: Paul Maurer, Dinos Vallianatos, Adam Hanley, Nicki Marinic, Ema Jolly, George Poenaru, Thanos Kazakos

Graphic Design: Gösta Wellmer, Philipp Roller, Max Mondon, Cameron Wakal

Kontakt Scripting: Nicki Marinic, Dinos Vallianatos, Adam Hanley, Thanos Kazakos

QA for Instruments powered by KONTAKT: Bymski, Achim Siebert, Christian Wachsmuth

MIDI Grooves: Simon Baumann, Jakob Kiersch, Wolf Simon, Janosch Brenneisen, Jon Mattox, Markus Lingner

Mixer Preset Design: Chuck Zwicky, Peter Funke, Clemens Matznick, Alex Ketenjian

Abbey Road Executive Producer: Peter Cobbin

Abbey Road Engineer and Project Management: Mirek Stiles

Abbey Road Assistant Engineers: John Barret, Kris Burton

Drums: Bret Morgan

Session and GUI Photography: Alexis Chabala

All Drums Provided by:

The Vintage Drum Yard: <http://www.vintagedrumyard.co.uk/>

Harris Hire: <http://www.harris-hire.co.uk/>